



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.12.2000 Bulletin 2000/49

(51) Int Cl.7: **H04Q 7/24**

(43) Date of publication A2:
14.06.2000 Bulletin 2000/24

(21) Application number: **99309583.5**

(22) Date of filing: **30.11.1999**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

- **Chuah, Mooi Choo**
Eatontown, New Jersey 07724 (US)
- **Yue, On-Ching**
Middletown, New Jersey 07748 (US)

(30) Priority: **07.12.1998 US 206428**

(71) Applicant: **LUCENT TECHNOLOGIES INC.**
Murray Hill, New Jersey 07974-0636 (US)

(74) Representative:
Watts, Christopher Malcolm Kelway, Dr. et al
Lucent Technologies (UK) Ltd,
5 Mornington Road
Woodford Green Essex, IG8 0TU (GB)

(72) Inventors:
• **Budka, Kenneth Carl**
Marlboro, New Jersey 07746 (US)

(54) **Methods and apparatus for route optimisation in a communications system**

(57) A route optimization technique in a GPRS network includes establishing a gateway GPRS support node in a visiting public land mobile network in which a roaming mobile station is currently located. Specifically, a tunnel is formed between the gateway GPRS support node and a serving GPRS support node to which the mobile station is in direct communication over a radio link. In this manner, external corresponding hosts may route packets to the gateway GPRS support node, rather

than the GPRS support node in the mobile station's home public mobile network, as is done in conventional GPRS networks. Advantageously, a shorter path is established for transfer of packets between a mobile station and a corresponding host. A similar route optimization technique is provided in a CDPD network, wherein a home mobile data-intermediate system node (local HMD-IS) in the foreign (visiting) network serves as a gateway node to the roaming mobile-end system.

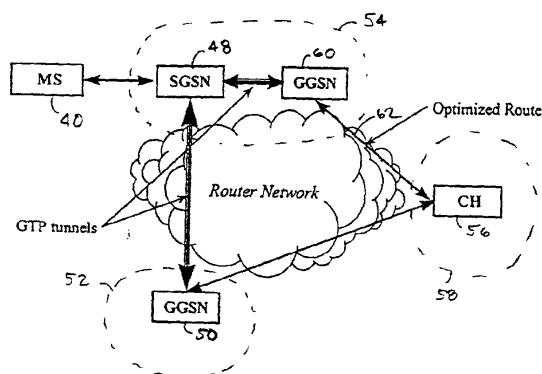


FIG. 6A



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 9583

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	GIOVANARDI A ET AL: "TRANSPARENT MOBILE IP: AN APPROACH AND IMPLEMENTATION" GLOBAL TELECOMMUNICATIONS CONFERENCE (GLOBECOM),US,NEW YORK, IEEE, 3 November 1997 (1997-11-03), pages 1861-1865, XP000737840 ISBN: 0-7803-4199-6 * see complete article *	1-3,8,14	H04Q7/24
Y	HAEMAELAEINEN J ET AL: "PROPOSED OPERATION OF GSM PACKET RADIO NETWORKS" IEEE INTERNATIONAL SYMPOSIUM ON PERSONAL, INDOOR AND MOBILE RADIO COMMUNICATIONS,XX,XX, vol. 1, 27 September 1995 (1995-09-27), pages 372-377, XP000645965 * see complete article *	1-3,8,14	
A	WO 96 21983 A (NOKIA) 18 July 1996 (1996-07-18) * page 7, line 1 - page 20, line 33; figures *	1-14	
P,Y	EP 0 917 318 A (LUCENT) 19 May 1999 (1999-05-19) * page 5, line 3 - page 33, line 39; figures *	15-17, 21,24	
Y	WO 98 19482 A (NORTEL) 7 May 1998 (1998-05-07) * page 6, line 11 - page 14, line 13; figures *	15-17, 21,24	
P,Y	WO 99 56445 A (TELIA) 4 November 1999 (1999-11-04) * page 5, line 30 - page 17, line 28; figures *	1-4	
		-/--	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 October 2000	Examiner Geoghegan, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.02 (P04001)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 9583

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
P, Y	WO 98 59468 A (NOKIA) 30 December 1998 (1998-12-30) * page 7, line 6 - page 14, line 21; figures *	1-4	
E	WO 00 14981 A (TELIA) 16 March 2000 (2000-03-16) * page 4, line 6 - page 7, line 17; figures *	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 October 2000	Examiner Geoghegan, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 30 9583

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-10-2000

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9621983	A	18-07-1996	FI 950116 A	11-07-1996
			AU 702765 B	04-03-1999
			AU 4392896 A	31-07-1996
			CA 2209715 A	18-07-1996
			CN 1173954 A	18-02-1998
			EP 0804844 A	05-11-1997
			JP 10512409 T	24-11-1998
			NO 973177 A	09-09-1997
			US 5970059 A	19-10-1999
EP 917318	A	19-05-1999	CA 2249817 A	14-04-1999
			CA 2249830 A	14-04-1999
			CA 2249831 A	14-04-1999
			CA 2249836 A	14-04-1999
			CA 2249837 A	14-04-1999
			CA 2249838 A	14-04-1999
			CA 2249839 A	14-04-1999
			CA 2249862 A	14-04-1999
			CA 2249863 A	14-04-1999
			EP 0912026 A	28-04-1999
			EP 0910198 A	21-04-1999
			EP 0917320 A	19-05-1999
			EP 0912027 A	28-04-1999
			EP 0912012 A	28-04-1999
			EP 0917328 A	19-05-1999
			EP 0918417 A	26-05-1999
			EP 0912017 A	28-04-1999
			JP 11289353 A	19-10-1999
			JP 11252183 A	17-09-1999
			JP 11275154 A	08-10-1999
			JP 11275155 A	08-10-1999
			JP 2000022758 A	21-01-2000
			JP 11275156 A	08-10-1999
			JP 11275157 A	08-10-1999
			JP 11284666 A	15-10-1999
			JP 11331276 A	30-11-1999
WO 9819482	A	07-05-1998	NONE	
WO 9956445	A	04-11-1999	SE 9802666 A	29-10-1999
WO 9859468	A	30-12-1998	FI 972725 A	25-12-1998
			AU 7920998 A	04-01-1999
			EP 0920761 A	09-06-1999
WO 0014981	A	16-03-2000	SE 9803045 A	10-03-2000

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82